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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,985	05/01/2001	Kenneth J. Cool	DFTR 112	3901

7590 03/21/2003  
KENNETH J. COOL  
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EXAMINER

BRUSCA, JOHN S

ART UNIT	PAPER NUMBER
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1631

DATE MAILED: 03/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/846,985

Applicant(s)

COOL, KENNETH J.

Examiner

John S. Brusca

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-12,14-18 and 20-30 is/are rejected.
- 7) ☒ Claim(s) 3,13 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

## DETAILED ACTION

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### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4-9, 11, 14-17, 20-23, 26, 27, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Altschul et al.

The claims are drawn to a computer implemented method of determining similarity between sequences of molecules, and computers and programs that execute the method. In some embodiments the method comprises a correlation step which is defined in the specification at pages 13-15 as determining the degree of similarity of the two molecules. In some embodiments the method comprises identification of the molecules that are similar. In some embodiments the region of similarity is identified. In some embodiments the molecule is a polypeptide.

Altschul et al. shows in the abstract and throughout a computer implemented method of determining the similarity of two or more polypeptide sequences. Altschul et al. shows generation of E values for alignments of molecules with similarity to a query, for example in Table 4. Altschul et al. shows determination of regions of similarity between two polypeptide sequences, for example in figure 3 and the discussion of PSI-BLAST.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 2, 12, 18, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Altschul et al. in view of Hexagen Technology Limited.

The claims are drawn to a computer implemented method of determining similarity between sequences of molecules, and computers and programs that execute the method comprising an optimization step regarding the encoding of the sequences, as defined in the specification on pages 12-13.

Altschul et al. shows in the abstract and throughout a computer implemented method of determining the similarity of two or more polypeptide sequences. Altschul et al does not show an optimization step regarding the encoding of the sequences.

Hexagen Technology Limited shows in the abstract and throughout a method of compressing biological sequence data to a minimum necessary number of bits to allow for more efficient computation of sequence data. Hexagen Technology Limited shows explicitly on page 4 to optimize polypeptide sequence data to 6 bits.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Altschul et al. by use of the data optimization method of Hexagen Technology Limited for the purpose of improving efficiency of computation of sequence data.

6. Claims 10, 25, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Altschul et al. in view of Benson.

The claims are drawn to a computer implemented method of determining similarity between sequences of molecules, and computers and programs that execute the method comprising use of a digital signal processor and a step including a multiply and accumulate operation.

Altschul et al. shows in the abstract and throughout a computer implemented method of determining the similarity of two or more polypeptide sequences. Altschul et al does not show use of a digital signal processor and a step including a multiply and accumulate operation.

Benson shows in the abstract and throughout a method of determining similarity of sequences of DNA or protein by use of a digital signal processor, and that the method runs more quickly than standard methods. The method uses a Fourier transform that includes a multiply and accumulate operation as shown on page 3002.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Altschul et al. by use of the digital signal processor method of Benson because Benson shows that use of a digital signal processor allows for more rapid computation of sequence comparisons.

7. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Altschul et al.

The claims are drawn to a computer implemented method of determining similarity between sequences of molecules, and computers and programs that execute the method comprising execution of two or more algorithms simultaneously.

Altschul et al. shows in the abstract and throughout a computer implemented method of determining the similarity of two or more polypeptide sequences. Altschul et al does not show execution of two or more algorithms simultaneously.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Altschul et al. by duplication of the method to perform multiple comparisons simultaneously for the purpose of increased speed of determination of multiple comparisons. The MPEP states in section 2144:

#### VI. REVERSAL, DUPLICATION, OR REAR-RANGEMENT OF PARTS

##### A. Reversal of Parts

In re Gazda, 219 F.2d 449, 104 USPQ 400 (CCPA 1955) (Prior art disclosed a clock fixed to the stationary steering wheel column of an automobile while the gear for winding the clock moves with steering wheel; mere reversal of such movement, so the clock moves with wheel, was held to be an obvious expedient.).

##### B. Duplication of Parts

In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) (Claims at issue were directed to a water-tight masonry structure wherein a water seal of flexible material fills the joints which form between adjacent pours of concrete. The claimed water seal has a “web” which lies perpendicular to the workface and in the joint, and a plurality of “ribs” which are parallel to the workface, forming the following shape:

The prior art disclosed a flexible water stop for preventing passage of water between masses of concrete in the shape of a plus sign (+). Although the reference did not

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disclose a plurality of ribs, the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced.).

#### C. Rearrangement of Parts

In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) (Claims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device.); In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (the particular placement of a contact in a conductivity measuring device was held to be an obvious matter of design choice). However, "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." Ex parte Chicago Rawhide Mfg. Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).

Therefore, mere duplication of processing of data has no patentable significance unless a new and unexpected result is produced in the method of claim 29.

#### *Response to Arguments*

8. Applicant's arguments filed 13 January 2003 have been fully considered but they are not persuasive. The applicants appear to contend that literal recitation of claim language is required for anticipation. However that is not a statutory requirement for rejections under 35 U.S.C. § 102(b). For reasons of record reiterated above it is maintained that each element of the rejected claims are either anticipated or obvious over the cited prior art. For example although Altschul et al. does not use the term "electronic hybridization assay" it is apparent from review of the specification that the phrase means a sequence comparison, as discussed in the first full

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paragraph of page 13 of the specification. The applicant has failed to point to specific differences between the applied prior art and the claimed subject matter beyond differences in terminology. Since it is maintained that the applied prior art anticipates or makes obvious the claimed subject matter, the rejections are maintained.

***Allowable Subject Matter***

9. Claims 3, 13, and 19 are allowable.
10. Claims 3, 13, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

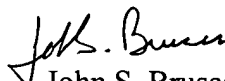
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to John S. Brusca whose telephone number is 703 308-4231. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward can be reached on 703 308-4025. The fax phone numbers for the organization where this application or proceeding is assigned are 703 746-5137 for regular communications and 703 746-5137 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0196.

  
John S. Brusca  
Primary Examiner  
Art Unit 1631

jsb  
March 20, 2003